

*Gen. Char.* Bill shorter than the head, compressed, exceedingly stout, obtuse at the end; culmen straight to the nostrils, then very convex to the decurved and acute tip of the upper mandible. Commissure slightly sinuate at the base, straight to near the tip, where it is suddenly deflected. Gonys regularly convex, the angle scarcely appreciable. Upper mandible covered with soft skin from the base to the nostrils, between which are two fossæ, the anterior shallow and oblong, the posterior triangular and deep, opening into the bare loral space; the two separated by an oblique ridge. Nostrils situated near the extremity of the anterior fossa. Outer three or four primaries abruptly attenuated near the end. Tarsus much abbreviated, comparatively stout, about three-fourths the middle toe and claw. Middle and outer toe nearly equal. Lobes of toes broad, connected at base for a greater distance than in other genera.

#### 1. *PODILYMBUS PODICEPS* (Linn.)

*Colymbus podiceps*, Linn., 1766. *Podilymbus pod.* Lawr., 1858. *Podil. lineatus*, Heerm., 1854. *Colymbus ludovicianus*, Gmel., 1788. *Podiceps ludov.* Lath., 1790. *Pod. carolinensis*, Lath., 1790. *Sylbeocyclus carol.*, Bon., 1838.

*Habitat.* Continent of North America.

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On a new genus of Fishes allied to *AULORHYNCHUS* and on the affinities of the Family *AULORHYNCHOIDÆ*, to which it belongs.

BY THEODORE GILL.

In the Proceedings of the Academy of Natural Sciences for July, 1861, (p. 168), I have described a new type of fishes, and referred it to the family of Aulostomatoids, with which it agreed in the elongation of the body, form of the head, opposition of the dorsal and anal fins and the development before the former of free spines as well as the presence of four branchiostegal rays. In the MSS. remarks on the relations of the genus, intended for the Report on the Fishes collected by the Northwestern Boundary Commission, I had commented on the relations of the new form and its affinity to the Gasterostoid genus *Spinachia*. I have now the pleasure of making known a genus which is still more closely related to *Spinachia*, and which it would not be even very improper to refer to the family of Gasterosteoids. It has, however, the four branchiostegal rays of *Aulostoma* and *Solenostomus*, as well as the more elongated tube. But I am disposed to believe that the four subfamilies\* of the Aulostomatoid fishes proposed in my former paper, are true families, and that *Aulorhynchus*, and especially the new genus are at least as closely related to the Gasterosteoids as to the Aulostomatoids. They agree with the former family in

1st. General form. 2d. Development of the dorsal and anal fins and the antecedent spines. 3d. Development of the forearm (ulnar and radial bones) and of the pectoral fin. 4th. Position of the ventral fins. 5th. Development of the caudal fin.

The affinity of the two families is further shown by the possession of other characters in common by the *Spinachianæ* and *Aulichthys*.

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\* The genus *Siphonognathus* of Richardson appears to be the type of a peculiar family (Siphognathoidæ), more nearly related to the Labroids than to the typical Aulostomatous fishes, although having the four branchiostegal rays, tubular snout, &c. of the latter. Dr. Gunther has first perceived its affinities, but appears to be wrong in referring it to the same family with the other Labroids.

1st. The special form. 2d. The extension of the facial bones. 3d. The armature of the lateral line. 4th. Extent of spinigerous dorsal surface.

When it is remembered how important and how peculiar are many of the characters thus enumerated, no one will hesitate to admit the close affinity of the two families. The tendency will be doubtless rather to unite the two, but after reflecting on the importance of the coincidence between the development of the facial bones and the number of branchiostegal rays, I would be very unwilling to do so myself.

With regard to the affinities of *Centriscus* and *Amphisile*,\* I have considerable doubt. If, on the one hand, an affinity to the Aulostomatous fishes is indicated by the development of the facial bones, the anchylosis of the anterior vertebræ, the development of the ventral fins, and, in the *Amphisiloids*, of the forearm; on the other hand, by the reduced number of the vertebræ and some other peculiarities, they evince at least a singular analogy to the *Plectognaths*.

#### Genus AULICHTHYS, Brevoort.

Body moderately elongated and almost cylindrical; the tail from the anus to the caudal fin is much elongated and gradually merges into the very slender caudal peduncle; the latter is little depressed, but its dorsal and inferior surfaces are nearly plane. Anus subcentral. Skin mostly naked; the lateral line is protected by a row of nearly concealed plates, which are each surmounted by a longitudinal carina ending in a spine directed backwards. Head oblong and quadrangular behind the eyes, and corrugated above. Tube slightly longer than the rest of the head, rigid and inflexible, tapering to the front, and subquadrate. Mouth terminal and small. The intermaxillary bones have moderate diverging limbs and the posterior processes longer than the limbs. Teeth on the jaws very fine. Nostrils nearly simple, situated at about a third of the distance from the eyes to the end of the tube. Branchiostegal rays four on each side. Dorsal and anal fins nearly intermediate between the head and caudal; they are opposite to each other, oblong, and have bifurcated rays. Anal fin close behind the anus. Dorsal spines extending from the nape to the fin; they are extremely short, subtriangular and compressed from before backwards, and each one is depressible in a groove, intervening between which and the succeeding spine are small corrugated plates. Caudal fin small or moderate. Pectoral fins oblong, with the rays

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\* *Amphisile* and *Centriscus* appear to represent two distinct but allied groups, distinguished by the difference of form as well as the difference in the development of the radial and ulnar bones. *Centriscus velitaris* Pallas, is an intermediate form.

The *Amphisilinae* would then have two genera:

1st. *Amphisile* Klein. Posterior process of dorsal cuirass with a spine articulated to its summit. Ribs 10—11. B 4. V. 4.

*A. punctulata* Brev. *A. strigata* Gthr.

2d. *Acentrachne* Gill. Posterior process of dorsal cuirass acute and not spinigerous. Ribs 6. B. 3. V. 3.

*Amphisile scutata* Cuv.

The *Orthichthyinae* with one genus:

*Orthichthys* Gill, with a straight body and longer anal.

*Centriscus velitaris* Pallas.

The *Centriscinae* are represented by two genera:

1st. *Centriscops* Gill. Body abruptly constricted behind the vertical fins. Breast with three longitudinal rows of plates.

*Centriscus humerosus* Rich.

2d. *Centriscus* L. Body oblong, slowly merging into the caudal peduncle. Breast with three longitudinal rows of plates.

1. *Centriscus scolopax* L. 2. *C. gracilis* Love. 3. *C. japonicus* Gthr.

[April,

apparently subequal and bifurcated. Antepectoral region longitudinally oblong. Ventral fins small, inserted a short distance behind the pectorals, and separated by the comparatively wide pubic bones. There are less than five rays to each ventral, the number being apparently a spine and four rays, which are simply articulated.

This genus is nearly related to *Aulorhynchus*, but differs in the ossified snout, which, like the crown, is corrugated, the structure of the jaws, the lateral row of plates, the form of the dorsal spines and the presence of intervening plates, and, finally, in the structure of the ventral fins and the armature of the pubic bones. The pectoral fins are mutilated, and it is therefore difficult to decide whether their form was similar to those of *Aulorhynchus*, but it is probable that such was the case, or that at least the inferior rays were as long as those immediately above, and consequently the posterior margins of the fins truncated.

#### AULICHTHYS JAPONICUS, Brevoort.

The snout forms 7-12ths of head's length, exceeds twice the height of the body and is nearly 1-7th of its length.

B. 4. D. XXV. S. A. I. 10. C. 5. 13. 4. P. 11. V. I. 4. Lat. line 52.

Purplish brown, darker over tube, lighter on abdomen; opercles silvery iridescent; humeral area bluish silvery, (*Brevoort*.)

*Habitat*.—Japanese coast.

#### Remarks on the relations of the Genera and other groups of CUBAN FISHES.

BY THEODORE GILL.

My attention having been attracted to the fishes of the Island of Cuba and some points in their classification and arrangement by the recent researches of Prof. Poey and his correspondence, it is here proposed to offer some observations on the affinities of the genera and higher groups found in the waters surrounding that island,\* the groups being discussed in the order of M. Poey's *Conspetus*.

M. Poey's arrangement differs chiefly from that proposed in the "Catalogue of the Fishes of the Eastern Coast of North America" by the precedence given to the subclasses Elasmobranchii and Ganoids, and to the Teleostean orders of Plectognathi and Lophobranchii. The distribution of the sharks and rays among families has also been omitted, as well as the subdivisions of families into subfamilies.

Seven of the families of Squali are represented in Cuban waters. They are the Galeorhinoidæ, Cestraciontoidæ, Lamnoidæ, Alopecoidæ, Notidanoidæ, Spinacoidæ and Ginglymostomatoidæ. The *Squalus tiburo* and *S. acronotus* belong to the genus *Isoplagiodon*, Gill; the *S. platyodon*, *S. obtusus* and *S. longimanus* to *Eulamia*. For the *Oxyrhina glauca* and its allies,† the genus *Isuropsis* has been lately proposed.

Of the Rays, five families are represented:

The Plectognathi are rather numerous. The most interesting is the *Hollardia Hollardi*, (Poey,) which is nearly allied to the *Triacanthodes anomalus* of Japan; the two genera appear to belong to a peculiar subfamily (*Triacanthodinae*) of the family of *Triacanthoidæ*.

The Percoids of Cuba are represented by many genera, and may be distributed in the following manner: the subfamilies are only provisional ones.

\* I entertain doubts as to the validity of some of the species proposed by M. Poey, but have generally preferred to leave to that learned gentleman the determination of such doubtful species.

† The species of Cuba is probably the same as the *Isuropsis dekeyi* of our own coast.